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Book Reviews

Lectures on Fourier Integrals (with an Author's Supplement on **Monotonic Functions, Stieltjes Integrals and Harmonic Analysis**). By S. BOCHNER. (Translated from the original 1932 German edition by M. Tenenbaum and H. Pollard.) Annals of Mathematics Study No. 42. Princeton University Press, 1959. 333 pp. $5.00.

Fourier Transforms. By S. BOCHNER and K. CHANDRASEKHARAN. Annals of Mathematics Study No. 19. Princeton University Press, 1948 (reprinted 1953). 219 pp. $3.50.

Harmonic Analysis and the Theory of Probability. By S. BOCHNER. University of California Press, 1955. 176 pp. $4.50.

This review is prompted by the publication of the long-awaited translation of Bochner's classical treatise (first title). Our viewpoint will, of course, not be that of the pure mathematician.

The importance of the *first book* is that it is one of the recognized standard works on the classical theory of Fourier integrals, but is also one of the major links in the chain which has led to modern developments, such as the Schwartz "distributions," which are bound to play an increasing role in applications. For readers better trained in classical analysis, it remains even now a useful introduction to these modern abstractions. Therefore, it is interesting to note that the translators' stated motivation was precisely "to make generally available . . . the historical and concrete problems which gave rise to (the modern abstract theories)." Even though the translators' concept of what is a concrete problem is not likely to coincide with that of the communications specialist, it is undoubtedly true that the period around 1930, when this book and those of Norbert Wiener were first published, was one of those fortunate times when dissatisfaction with the existing mathematics, as tools in applications, led to the creation of new and more powerful mathematics . . . and also to the solution of the concrete problems. The books of Wiener have, for good reasons, been far better known by communication specialists; this is one more reason to believe that they will find something still fresh and of value in the work of Bochner.

One of the special features is the completeness of the coverage of topics linked with the characteristic functions of probability theory, the positive-definite functions, etc. These topics can now be found in books on probability theory, such as Loeve's; however, Bochner's presentation may still be more attractive to the person trained in classical analysis.

The *second book*, the least personal of the three in its style, is a collection of miscellaneous topics, linked together by the whim and pleasure of the authors, and not by any mathematical or concrete criterion. Two of these topics are bound to be very useful in applications: the Fourier transforms in several variables,

and the considerations on Banach spaces. The form is particularly elegant, and as easy going as any mathematical book in this area.

Finally, the *third book*, which has the most tempting title, is likely to be very disappointing to the application-minded reader. It is written in a very personal and concise fashion, and several very different kinds of considerations intertwine all along. The contributions to probability theory refer in particular to the infinitely divisible distributions (including stable distributions) and to Markoff processes. The first topic is seemingly on the verge of important applications, but the reader is unlikely to use Bochner's results for some time. The second topic is presented in a very challenging fashion, but the mathematics will have to be much reworked before it can be used (in particular, the concept of subordination is presented in a frustratingly sketchy fashion).

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The Decipherment of Linear B. By JOHN CHADWICK. Cambridge University Press, 1958. pp. $3.75.

Documents in Mycenaean Greek. By JOHN CHADWICK and MICHAEL VENTRIS. Cambridge University Press, 1956. 452 pp. $15.00.

One of the great riddles of classical archeology was solved around 1952 when the British architect Michael Ventris (1922–1956) deciphered the "Linear B" script which dates back at least to 1400 B.C., and is found on clay tablets in Mycenae and in the ruins of the palace of Minos on Crete. The difficulty was that both the "code" and the language of the "message" were unknown, and that there was no bilingual document to start with. Ventris identified the language as an archaic form of Arcadian Greek, and identified the code as being essentially based upon a syllabary. The procedure which he followed was essentially that of cryptography, and his achievement is of the greatest interest for persons interested in coding problems (as well as for their less technically inclined friends and relatives).

The *first* of the books under review is a quite popular account written, after the untimely death of Ventris, by John Chadwick, his friend, associate, and consultant on Greek philology. Several features of this small volume, associated with its popular character, may not be liked by technically trained readers; there is also perhaps too much biographical material. One cannot complain, however, that the history of Ventris's work is very much emphasized: in such cases, it is very important to show that the solution was not somehow "read into" the data, but was developed logically.

The core of the book is made of chapters 4 and 5, and of chapter 6, which is devoted to answers to several critics. Other chapters provide some background in archeology. The point of departure of the decipherment was the availability of "grocers' accounts" containing, besides the signs which were conjectured to be syllabic, some ideograms, the meaning of which can be reasonably conjectured, and some signs believed to be numerals. As to the point of arrival, we would like